h.e.l

Parallel Process Development

Configurable systems for scalable chemical synthesis and advanced screening

Parallel Reaction Platforms

Future Proof Parallel Systems for Faster Development

H.E.L's PolyBLOCK and AutoMATE platforms designed for parallel chemical synthesis, screening, and process optimization. PolyBLOCK offers a compact, modular format with up to 8 independent reaction zones, each with full control of temperature, pressure, stirring, and dosing. AutoMATE delivers the same level of precision and automation in a larger, scalable format ideal for more complex or higher-volume workflows. Both are powered by our intuitive WinISO software.

PolyBLOCK

Automated reaction station

Small Footprint (Excluding circulators, pumps, and optional accessories)
PolyBLOCK 8 (left): 36cm x 21cm x 20cm
PolyBLOCK 4 (right): 36cm x 25cm x 21cm

Maximize your laboratory's productivity with parallel synthesis technology. H.E.L's PolyBLOCK is an easy-to-use, flexible, and compact multi-reactor system.

Advanced Agitation

Built-in magnetic stirring with optional overhead agitation on PolyBLOCK. AutoMATE comes with direct overhead agitation as standard, ideal for highly viscous or demanding reactions.

Compact, Scalable & Modular

4 or 8-reactor benchtop system for parallel synthesis
Do more experiments, in less space, with a system that adapts as your projects evolve.

Seamless PAT

Multiple options for accurate logging of process parameters (e.g. pH, turbidity probes)
Seamless integration of probes for richer insights.

Interchangeable Reactors

Available in a wide a range of volumes and materials ranging from 2ml to 500ml. Suitable for ambient and high-pressure reactions and compatible with both PolyBLOCK and AutoMATE. **Optional** 1L custom reactor available for AutoMATE. Highly configurable and modular build adaptable to evolving requirements.

Independent Control

Each reactor is independently controlled but operated in parallel
Pressure: Up to 200 bar (material dependent)
Temperature: -40 to 200°C, with up to 100°C difference between zones, with a circulator.

From Chemical Synthesis to Catalysis and more

AutoMATE

Highly functional, versatile, customised platform

AutoMATE Footprint: 105 x 50 x 90 cm (Height dependent on motors)

High-performance, fully automated independent parallel reaction platforms offer flexibility, efficient space utilization, a broad range of features and controls.

Bench top platform

Linear 4-reactor system for efficient chemical synthesis. Modular design for R&D and process development.
Run 4 experiments at once to reduce R&D timelines.

Independent Control

Each reactor is independently controlled but operated in parallel
Pressure: Up to 200 bar (material dependent)
Temperature: -40 to 250°C, with up to 100°C difference between zones, with a circulator.
Optional upgrade for AutoMATE to 350°C.
Different chemistries, different settings, all at the same time.

Ease Of Use

Clamping design for easy removal of reactors. Ideal for larger high-pressure reactors where the reactor and head plate can be heavy. Increasing the safety and usability of the system.

Feeds

Fully configurable liquid gas dosing protocols. Customizable control loops - pH-hold, temperature dependent dosing and more. Versatile sampling options. Automate complex dosing steps and boost reaction reproducibility.

Customized Chemistry

Reactor choices

Variety of vials, tubes, and flat bottom flasks ranging from 2ml to 500ml. All of these come with different lid options based on the size of vessel. These lids support different types of agitation and a variety of Process Analytical Tools (PAT) and liquid feeds.

Agitation

Magnetic, suspended, and overhead agitation options both available with a variety of impeller options. Providing agitiation for different viscosity levels. H.E.L's software contains decoupling detection, enabling magnets to recouple automatically. Learn more in our reactor catalog.

Magnetic agitation

Suspended agitation

Overhead stirring for high viscosity liquids

High pressure reactors

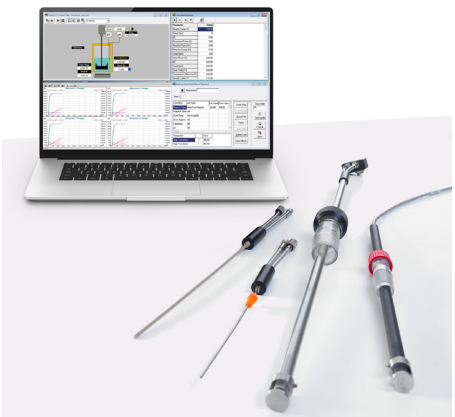
Wide range of high-pressure vessels available, from 16ml to 500ml, with options for suspended or overhead stirring. Reactors are available in 316 stainless steel or C276 hastelloy, rated up to 200bar.

Catalyst screening reactors

Single pressure-rated reactors, designed for parallel catalyst testing, house multiple HPLC vials to test reactions simultaneously under identical conditions. Ideal for early-stage screening with minimal material use. Pressure-rated body (up to 200 bar) with temperature control and optional agitation.

Process monitoring and control

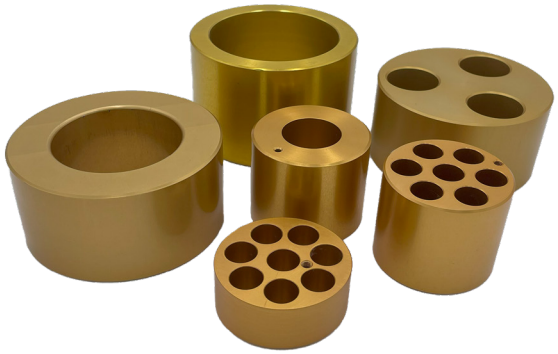
Range of probes (pH, turbidity, temperature, pressure, DO, redox, etc) for monitoring multiple reactors, as well as several third-party PAT probes and equipment (FTIR, GC-MS, etc) fully integrated into software.



Use any combination of reaction vessels on one platform

Quick exchange between applications

Easy to use adapters ensure optimal heat transfer. Choose the adapter for your vials, tubes, flasks, or vessels. Custom inserts available. One platform for diverse experiments, future proof, and adaptable as your projects evolve.



Condenser and inerting manifold

- Easy quick-connect solution for managing multiple condensers and inerting
- One connection for inert gas and water supply
- Allows use of traditional condensers
- Seals allow condensers to be removed without cooling liquid spillage
- Also available is a water cooled inerting and condensing block, with adapters for vials, tubes, and reactors, suitable for both PolyBLOCK 8 and 4.

ATEX Compatibility

For reactions involving flammable gases or high pressures, safety is non-negotiable. H.E.L systems* can be configured with ATEX-certified components, including sensors, valves, stirrers, and pumps.

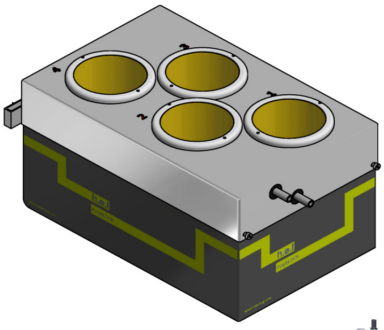
Control electronics can be located outside the classified zone, ensuring safe operation without compromising functionality. Ideal for hydrogenation, exothermic reactions, and other high-risk chemistries. Built for compliance. Designed for confidence.

*System dependent

Bespoke solutions
Looking for bigger volumes, higher pressures/temperatures, special reactors? Speak to us about your requirements

Modular Design For Your Application Needs

Increase the efficiency of your process screening and optimisation with H.E.L's multi-zone solutions. The modular architecture of the PolyBLOCK system offers manual and full automated tailored solutions. Configure a system for your needs with this unified solution.



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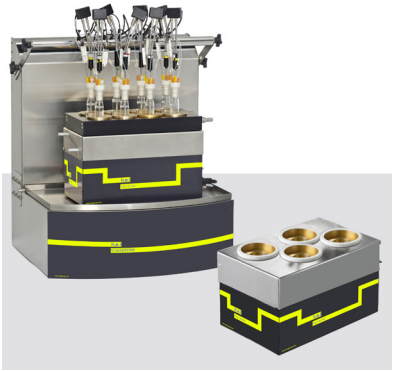

ChemSCAN

PolyCAT

CrystalSCAN

Tailored solution for Hydrogenation

Ideal for Crystallization

H.E.L Customers

QUEEN'S UNIVERSITY BELFAST

secantmedical Biomedical Textiles by Design

Cipla

Hear what our customers have to say...

"The PolyBLOCK has increased throughput by allowing us to easily and efficiently run multiple reactions." – Secant Medical – USA

Bringing effortless efficiency to your laboratory automation

With the power of WinISO, you can elevate your research with a software solution that adapts to your needs.

Flexibility and control

- Fully configurable workspace – improved efficiency by displaying the info you need
- No swapping between windows required; configure the workspace to suit you
- Powerful and flexible code base combined with an intuitive and user-friendly design
- Increase reproducability and reduce human error

Empowering proactive experimentation

Designed around the user experience, WinISO combines:

- Advanced real-time data display
- Automated monitoring of experiment completion and failure states
- Rapid data capture modes
- Easy DoE with the creation of custom plans in our offline simulator mode across single or multiple parallel reaction systems

Real-time interactivity

- Change and adapt on the fly as you navigate through your experiments.
- Interactive design empowering real-time adjustments
- Ensure that your research evolves, aligning with your insights and discoveries

Safety at the core

- Robust safety features protect both the operator and the experiment
- Ensuring a secure environment for your experiments, allows you to focus on pushing boundaries

For more information, and how to request an upgrade, visit
https://helgroup.com/products/laboratory-automation-software/
or speak to your local H.E.L representative

Process Optimization for any Application

High throughput

Fully automated and flexible process development platform

- Providing 8 individually controlled reactor zones, see figure 1
- Providing increased throughput
- Allows live recipe changes at anytime
- Makes possible parallel evaluations such as drug stressing, solubility studies, catalyst/route selection, and other custom applications

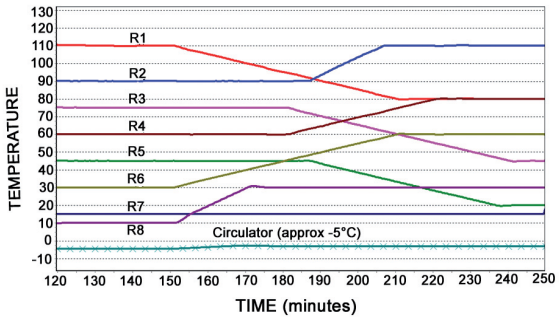

Figure 1. PB8 Independent temperature ramps, 30ml vessels

High pressure catalysis

Homogenous or heterogeneous catalyst research (e.g. hydrogenation) with a range of reactor types and sizes, at pressure

Process development

- Catalyst screening compatible with the PolyBLOCK, PolyCAT, or ChemSCAN platforms
- Independent pressure and temperature measurement and control
- Available with gas (and liquid) dosing options, using fully stirred reactor volumes from 2 to 500ml

High throughput catalysis

- Available in 18 or 24 position, supporting parallel screening in high-pressure (100 bar) and high-temperature (up to 250 °C) conditions, with working volumes from 1 ml to 4 ml
- For larger-scale parallel catalyst screening, the CAT 7 is designed to be used with 7 standard 10 ml vials. Run manually outside of the PolyBOCK or AutoMATE platform

PolyCAT High pressure cataylst screening

Parallel crystallization

Automatically generate solubility curve in up to 8 reactors

Automated determination of solubility or Metastable Zone Width (MSZW) in up to 8 reactors, over a range of concentrations.
Working volume: 1ml to 500ml.

The system will automatically:

- Heat/cool each sample independently
- Detect dissolution/crystallisation

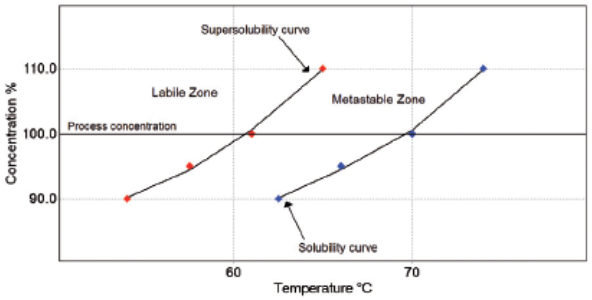

Figure 2. Raw temperature and turbidity data is displayed graphically as the experiment proceeds. Off-line data analysis is possible using HEL's advanced software options to produce a complete MSZW plot

CrystalSCAN using PolyBLOCK PB8

Reaction calorimetry

On-line, parallel

Simplified calorimetry for process development chemists, requiring no calibration and gives real-time, on-line data.

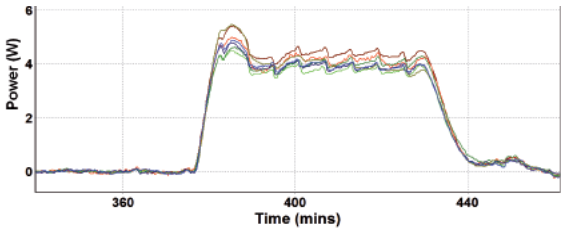

Figure 3. Simultaneous heat flow calorimetry on all zones of 8-pot PolyBLOCK

Hear what our customers have to say...

"A versatile time saving tool for QBD & DOE study for all kind of chemistry, crystallization, & even integrated with Calorimetric study. H.E.L motto "Better Chemistry – Faster" matches with output of instrument giving better control over chemistry & faster result. Thanks for making our work simple." - Cipla – India

Specification Table

Specification Point	PolyBLOCK 4	PolyBLOCK 8	AutoMATE
Platform type	Compact parallel Ideal when bench space is limited, or for specific applications	Compact parallel Ideal when bench space is limited, or for specific applications	Linear parallel Ideal for more complex applications. Expandable functionality
Typical applications	- General chemical synthesis - Process screening - Process optimization - DoE campaigns - Bespoke applications	- General chemical synthesis - Process screening - DoE campaigns - Bespoke applications	As with PolyBLOCK, but configurable for more demanding situations, e.g. - larger volumes - very viscous materials - extended temperature range - greater accessibility for multiple feeds - sampling and sensor options
Application specific options	Solubility/crystallization monitoring - Metastable zone width determination Online calorimetry* - Reaction enthalpy, reaction kinetics	Solubility/crystallization monitoring - Meta stable zone width determination Online calorimetry* - Reaction enthalpy, reaction kinetics	Solubility/crystallization monitoring - Meta stable zone width determination Online calorimetry* - Reaction enthalpy, reaction kinetics
Number of independently controlled reactors	4	8	4
Maximum reactor volume	500 ml	200 ml	500 ml **Optional:** 1 L custom reactors available
Reactor options	Please see separate Reactor Options		
Temperature range**	Ambient to 200 °C (without external circulator; software limited) **Optional:** - Low temperature circulator dependent. (Typical config, down to -40 °C)	Ambient to 200 °C (without external circulator; software limited) **Optional:** - Low temperature circulator dependent. (Typical config, down to -40 °C)	Ambient to 250 °C (without external circulator, software and glassware limited) **Optional:** - Low temperature circulator dependent. (Typical config, down to -40 °C) - High temperature up to 350 °C
Sensors	- Reactor temperature - Zone temperature - Stirrer speed **Optional:** - pH - Turbidity - Redox - Conductivity - Dissolved oxygen - Additional integration of third-party probes possible	- Reactor temperature - Zone temperature - Stirrer speed **Optional:** - pH - Turbidity - Redox - Conductivity - Dissolved oxygen - Additional integration of third-party probes possible	- Reactor temperature - Zone temperature - Stirrer speed **Optional:** - pH - Turbidity - Redox - Conductivity - Dissolved oxygen - Additional integration of third-party probes possible

*requires WinISO software platform
**Temperature range measured in reactor

Upgrades, support, and training

We understand that your needs can change over time and you may require:

- System upgrade
- New team member training
- Process development support
- Preventive maintenance and service contracts

Our dedicated service team and highly knowledgeable technical staff will work with you to find the right solution.

Customer service enquiries & technical support requests

E: service@helgroup.com
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About H.E.L Group

H.E.L Group's mission is to work together with chemistry, safety, and biotechnology experts to engineer and unleash the full potential of the scientific community. To this end, H.E.L develops and manufactures innovative scientific instruments and software designed to optimize the efficiency, safety and productivity of key processes in chemistry and biology applications.

The H.E.L team includes highly skilled process and software engineers, based at their extensive research and manufacturing facilities in the UK, as well as sales and support offices around the world.

H.E.L has a long history of solving complex challenges for customers. For more than 30 years the company has worked with businesses and laboratories globally, providing proprietary automated solutions for the pharma, biotechnology, chemical, battery and petrochemical sectors.
H.E.L is accredited with ISO 9001 : 2015 and ISO 14001 : 2015.

- With a strong focus on the customer, our **service and support** enables our customers to keep working efficiently
- Our **wide range of customizable products** put the customer at the heart of what we do, with solutions designed around their needs

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